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Use of Technology in Managing Electronic Resource Workflow

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Use of Technology in Managing Electronic Resource Workflow

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Introduction

In the past, requesting a new resource for a library was a fairly simple process. A selector communicated the request for the resource (usually a book) and technical services ordered the book, cataloged it, and placed it on the shelf. Today, things have changed — slightly. Libraries are now also receiving requests for electronic resources; these resources present an entirely new workflow with a number of additional steps. Resource licenses must be negotiated, information about the license and resource must be recorded in an Electronic Resource Management (ERM) system, and the resource must be activated and deployed in library finding tools. Even the deployment of the resource is not the end of the workflow; problems reported with the resource must be solved and the resource must be evaluated to gauge its continued utility. In addition to these multiple steps, another feature of electronic resources presents additional problems. Electronic resources are intangible; that is, there is often no physical item associated with an electronic resource, so there is nowhere to attach anything with which the resource can be tracked. This article will describe the electronic resource workflow in more detail and describe a solution devised at **Cornell University** for tracking electronic resources through this workflow.

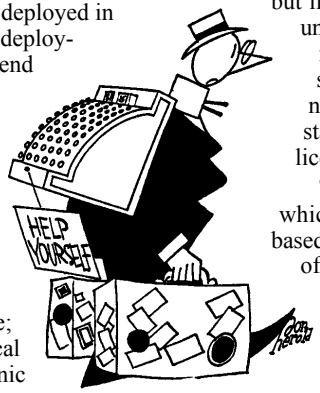
Receiving Requests for Resources

When requesting a book or other printed material, selectors usually provide information such as the title or ISBN. However, when selectors are working with electronic resources, they have often had initial discussions with vendors about such matters as the price of a resource. Communicating these discussions with technical services is crucial, whether it is by email, phone calls, or meetings. However, it can be difficult to associate these communications with the particular electronic resource in question since it is intangible.

Once a request for a resource is received by technical services, technical services staff verifies the URL, title, and format of the resource, and also determines if a license needs to be signed before the resource can be ordered. Some additional communication with selectors may be necessary at this point if any information is unclear. Once any clarifications are made, each request is assigned to the person responsible for the next step of the workflow, usually license negotiation if the license is being purchased by the library, rather than available at no cost.

Negotiation of Resource Licenses

After a resource has been requested, the next step in the process is to contact the vendor to further determine the pricing for the resource and ask for a license agreement. Both the pricing and license agreement are negotiable and this step may have several iterations before a price and license are agreed upon by the vendor and library. Price negotiations are commonplace and will not be discussed here, but license negotiations, while not unique to business, are relatively new to academic libraries, so it is useful to highlight a number of clauses which library staff look for when negotiating license agreements.



Two of the main criteria upon which the price of a resource is based are the number and location of individuals who will use the resource. Determining these factors can often involve complex negotiations. For example, a resource may be priced according to different user levels and it may be cheaper for a university to permit access to only those individuals within a certain school or college, rather than the entire university. In addition, a university may consist of units that are located in more than one geographical location. Some vendors permit access to multiple locations at the same price level as one location, but others require a separate site license (and payment) if a separate geographical location also lies under a separate administrative body. Some vendors permit the use of their products by walk-in users, or those who are physically present at the licensee, whether or not they are members of that licensee's institution.

Academic libraries also negotiate for fair use of the resource content, whether for interlibrary loan, course packs, or electronic reserve. Some license agreements refer to the clause in the copyright code that covers all these fair uses, while others require that each type of fair use be negotiated independently. Some agreements allow some instances of fair use, some allow all, and a few are extremely stringent in providing fair use access to the resource in question. Although efforts such as **NISO's Shared Electronic Resource Understanding (SERU)**[1] have been made to get vendors and libraries to agree to standardized license terms, this is still a work in progress.

Recording of Licenses in Electronic Resource Management (ERM) Systems

Electronic Resource Management (ERM) systems are becoming increasingly popular to record pertinent licensing and other information. The license terms noted above such as inter-library loan, e-reserve permissions, and geographic restrictions may all be recorded within an ERM system in a "license record." The "resource record" contains more descriptive information about the resource itself. Journal title lists and holdings are attached to e-journal resource records. Additional information, such as vendor or publisher contact details, log-in values for e-journal and database administrative modules, and other important facts also may be recorded in the resource record. In addition, actual licenses can be scanned, stored in a separate server, and then linked to the ERM system via a URL.

Resource Acquisition and Activation

Once licensing has been completed, technical services staff then process orders for electronic resources. Once an order has been placed, technical services staff often need to activate a journal or database so that the library community and patrons may use the resource. The ways electronic resources are activated or registered for access are as varied as the types of electronic resources added to a libraries collection: the publisher can be contacted and supplied with a list of IPs, an administrative module can be used to activate a resource, or the publisher may activate a subscription to an electronic resource.

Deployment of Resources in Library Finding Tools

Once a new electronic resource is acquired, it must be entered in a number of the library's finding tools. These include the library catalog, a federated search system, an alphabetical database listing, the electronic resource management (ERM) system, a list of electronic journals, and a list of digital collections.

Cataloging an electronic resource is similar in many ways to cataloging any traditional resource, but has some distinct differences as well. When resources are available on the World Wide Web, their catalog records must include a URL in the MARC 856 field. For resources that the library pays for and restricts access to, this URL includes a proxy script that restricts access to only those who are members of the campus community or subset of that community. These proxy scripts also enable patrons to be authenticated as library users

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so they can access electronic resources from remote locations off-campus. Many libraries rely on proxy servers for remote authentication. One example of a proxy application is **EZproxy**, which is mounted on a local server with a local IP address, so the vendor recognizes the IP as part of the institution's range. **EZproxy** then acts as an intermediary between the remote patron and the e-resource, re-interpreting the resource URLs to communicate both at the vendor and patron ends.[2]

In addition, many libraries record basic subject keywords in the catalog that support their other finding tools; catalogers must record these as well as Library of Congress Subject Headings (LCSH) in the catalog record for an electronic resource. Libraries may go so far as to consider their catalogs as repositories for storing the metadata (subject keywords, etc.) that support not only the catalog, but their other finding tools. Many libraries are also bulk-loading vendor-provided MARC records to accommodate the ever-increasing numbers of e-journals and eBooks. Automated processes allow the library to substantially reduce the time needed to create and maintain records.

Another set of finding tools in which the resource must be recorded are the library's federated search system and alphabetical database listing, both usually managed through the same product. There are two types of federated search systems, those maintained in house by the library and those outsourced to a vendor that maintains the system on its own server. Federated search systems record some of the same information about an electronic resource as does the catalog — title of the resource, subject keywords, and URL. In federated search systems locally managed by the library, this information can be ported directly from the library catalog into the federated search system; some libraries are using tools like MARC to XML converters to migrate MARC-encoded metadata from their integrated library systems to their federated search systems. With federated search systems managed via vendor servers, library staff needs to contact vendor staff with similar information about the resource to ensure that it appears in the federated search system. In both cases, the resource needs to be tested in the federated search system to make sure that it works. If the resource does not work in a locally managed system, library staff can make changes to the resource until it works. However, if the resource doesn't work in a system managed externally by a vendor, library staff has to correspond back and forth with the vendor until the resource works; this adds another workflow step to the process.

Two other finding tools in which to record new electronic resources are the electronic journal alphabetical list and the library's list of digital collections. Electronic journals are recorded in the alphabetical list when they are recorded in the ERM system, so this step has already been accomplished earlier in the workflow. Some libraries record their locally created resources in a Web-mounted list of digital collections which is used not only as a finding tool but also a marketing tool for the library itself; recording locally created resources in such a list distinguishes them from all other electronic resources the library makes available.

Resource Problem Reporting

Because of the mutability of the World Wide Web, electronic resources are not static and often present problems down the line not present when they were first activated and deployed. These problems fall into two different categories, problems reported by library patrons who use the resources and problems reported by library vendors who have identified instances in which the resources have been abused.

In many libraries, patron complaints are first fielded by reference staff, but if they are unable to solve the problem, they forward the information to technical services via phone or a list-serv. Patrons may not be able to access a resource because of issues with payment, technical difficulties on either the publisher's end or the library's end, openURL linking failures, or remote access difficulties. Again, good communication is key, as technical services staff need to contact patrons, account or subscription managers, vendors who handle the library's subscription payments, or one another. Some problems require a fair amount of discussion, or may bring to light some larger issue that needs to be addressed in greater detail.

The most common abuse of an electronic resource is mass downloads from that resource, and the most common way vendors use to notify the library about this abuse is through email. Libraries usually resolve these issues by reporting the abuse to the campus information technology (IT) department which then prevents the offending IP address from further accessing the resource. The library then lets the vendor know that this action has been taken. This workflow must take place quickly because many resource licenses stipulate that any abuses must be rectified within a certain time period or the library's access to the resource will be deactivated.

Resource Evaluation

In addition to their licensing, acquisition, deployment, and troubleshooting, electronic resources must be evaluated. The most common method of evaluating a resource is through usage statistics. With initiatives such as **COUNTER** to standardize the information contained in usage statistics from different vendors and **SUSHI** to standardize the way that information is pulled into ERM systems, the collection of statistics to use in resource evaluation has never been easier. For example, the **ScholarlyStats** product[3] enables libraries to automatically receive statistics from any one of a number of vendors chosen from a list; these statistics are pulled into a single Website which then can be accessed by the library. However, statistics alone may not be that helpful to libraries; usage statistics for a particular resource must be considered along with the cost of the resource to develop a cost per use metric that is more helpful in evaluating the resource.

It should be noted, however, that despite their ease of collection and use, usage statistics are not the only means by which a resource should be evaluated. Other questions libraries should ask themselves when evaluating resources include *who* uses a resource; *how* the resource is used; and *how* the resource is supported by the vendor. For example, a resource that has low usage statistics may be used by stakeholders that are important to the library — the resource use of those stakeholders may count for more than any one typical use. In addition, even though a resource may have low usage, it may be used in ways that are particularly important to other library projects; for example, a bibliographic database used at one of the authors' libraries had relatively low usage, but some of the usage was in support of a major digitization project in which the library was involved. Finally, even though a resource's usage statistics may be high and its stakeholders important to the library, the lack of support by a vendor — either in negligent administration of the resource in general, poor customer service, or continued significant price increases — may present the library with the very difficult decision to cancel the resource.

> ***"Cataloging an electronic resource is similar in many ways to cataloging any traditional resource, but has some distinct differences as well."***

Managing Resource Workflow: One Solution

As one can see, managing electronic resources is a complex task that involves a number of steps and individuals within and outside of the library. One characteristic of electronic resources that contributes to this complexity is their intangibleness — there is no physical item in which to put a "routing slip" or similar device that libraries have used to track the flow of physical resources in the past. Another contributing factor to this complexity is that some steps of the workflow are not linear — they require multiple conversations before they can be checked off in the workflow list as having been accomplished. One example of a nonlinear step in electronic resource workflow is the negotiation of licenses with vendors that requires a great deal of back and forth between the library and vendor before the license is considered satisfactory to both parties.

Cornell University Library recently began using a software product called **Mantis** which was already in use by the library for problem-tracking for various projects. **Mantis**[4] is a free, open-source, Web-based bug-tracking system created by **Kenzaburo Ito** in the early 2000s and now administered by **Ito** and **Jeroen Latour**, **Victor Boctor**, and **Julian Fitzell**.[5] **CUL** has adapted **Mantis** to facilitate

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the receipt of electronic resource requests from selectors and track electronic resources through the entire workflow process.

Using Mantis for Receiving Resource Requests

Cornell University is an extremely complex organization, consisting of both private and land-grant colleges that reside across New York State, from the main campus in Ithaca, New York, to the agricultural experiment station in Geneva, New York, and the medical school in New York City and Doha, Qatar. **Cornell University Library** consists of twenty libraries, including branches for the agricultural experiment station and the medical school. Thus, in many cases, **Cornell University Library** selectors can not just walk across the library to hand a technical services staff member a request for an electronic resource. For several years, **Cornell University Library** has recognized the difficulties encountered by widely dispersed selectors in communicating requests for intangible items. In the past, it had used something called a **Networked Electronic Resource Form**, or **NERF**, which was included in the Library Technical Services (LTS) Website and utilized by selectors any time they needed to request a new resource. The **NERF** asked selectors for several pieces of information about a resource, including the name of the resource, its URL, what federated search subject categories it should be included in, use restrictions, and payment information.

This form was not interactive, however, and selectors had to print out the form from the Website, fill it in, and send it through campus mail to library technical services. **Mantis** was used to not only make the **NERF** interactive on the Web, but also to tie the form into the **Mantis** tracking system. This way, selectors could not only use the new **Mantis**-based **NERF** to request new resources, technical services staff would no longer have to key the information into a Web form — it would be automatically added into the **Mantis** tracking system. In addition, selectors would be able to use the tracking system to see where in the workflow process any particular electronic resource was, thus reducing the number of email messages and phone calls back and forth between selectors and technical services.

Using Mantis for Tracking Resource Workflow

The tracking system also enables LTS staff to monitor the resource as it goes through the process of being added to the **CUL** collection. LTS consists of four distributed units: Acquisitions and Cataloging, Database Management Services, Electronic Resources and Serials Management, and Metadata Services. The Electronic Resources and Serials Management staff is located in the **Albert R. Mann Library** on the university's agricultural quad, while the majority of the other LTS staff is located in **Olin Library**, the main campus library located on the university's arts and sciences quad. Several LTS staff are also located in the smaller unit libraries across campus. However, despite this distributed nature, personnel from every unit are involved in electronic resources workflow. Centralizing e-resources requests in a Web-based client which is viewable by many LTS staff eases communication problems; a piece of paper is no longer passed from person to person and across campus.

Several steps are listed on the "checklist" included in the tracking system, although not every step is used for each new resource. Some of the steps include: licensing, ordering, local record creation or bulk-loading of vendor records, adding the resource to the **EZproxy.cfg** file, and creating openURL links. Some steps are very specific to **Cornell**, such as notifying the librarians at the **Weill Medical College** when a new resource has been added to which they are also allowed access.

The tracking system allows technical services staff to write notes as needed and to check off tasks which have been completed. The system allows for a great deal of flexibility; for example, a selector can upload a **Microsoft Word** document listing each title in a package of fifty electronic books, rather than submitting an individual **NERF** for each title. In addition, multiple communications between **Cornell** and a vendor can be recorded in the tracking system. The tracking system also allows technical services staff to forward electronic resources to one another once each person is done with his or her part of the workflow. Overall, the system is very flexible which is helpful since no two electronic resources follow exactly the same pattern.

Conclusion

In its investigation of electronic resource workflow, **Cornell University Library** staff created the model described in this article, which shows that acquiring, deploying, and evaluating electronic resources is not nearly as simple a process as it was for traditional, print resources. Other libraries considering electronic resources may find that this model helps in thinking about the various steps encountered in working with electronic resources. Those libraries that have already identified a workflow for electronic resources may find the **Mantis** solution developed by **Cornell** helpful in managing their workflow. Libraries may have developed other solutions to help manage electronic resource workflow, but **Cornell** has found that using **Mantis** has enabled its staff to effectively communicate with one another about electronic resources and keep abreast of the place of any particular resource in the electronic resource workflow.

Endnotes

1. *http://www.niso.org/committees/SERU/*
2. *http://www.usefulutilities.com/support/overview.html*
3. *https://www.scholarlystats.com/*
4. *http://www.mantisbt.org/*
5. *http://www.mantisbt.org/manual/manual.about.mantis.history.php*

The Future of the Academic Library Serials Collection

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In the early days of American universities and colleges, the academic library was insignificant and "functioned as a storehouse" for non-curriculum related books, mostly donated, and those purchased with donated funds (**Johnson**, 4-5). The academic library did not support the curriculum, as universities did not emphasize scholarship (**Johnson**, 5). The **Morrill Act of 1862** created land-grant universities and obliged them to produce scholarly material, resulting in a scholarly emphasis and an increase in scholarly publication (**Johnson**, 5-6). Suddenly, "the academic library became a necessity" for obtaining needed research (**Johnson**, 6). Since then, the academic library has supported the university curriculum and research and continues to collect, organize, and provide access to information. However, due to increasing patrons' expectations, skyrocketing costs, and academic library budgets which fall behind costs, many of them struggle to provide scholarly journals. This article will concentrate on the trend of academic libraries to provide journals through electronic subscriptions and databases, along with the effect this has on budgeting, staffing, and work flows. Whereas the academic library's activities were once separated into collecting, organizing, and creating access to resources by specific staff members, to some degree, the lines are blurred and those areas have become the responsibility of all staff. In order for electronic journal implementation to be successful, staff must be united in their efforts to accomplish the goal of providing access; without integration, access may be compromised and the value of electronic journals may be null.

In the face of enormous journal price increases and the desire to expand access, some academic libraries have eliminated print subscriptions in favor of electronic subscriptions.

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